Week 6 Drilling and Scientific Report for IODP Expedition 381
Corinth Active Rift Development 2017

27th Nov 00:00 – 3rd Dec 24:00 EET Eastern European Time (UTC+2)

1. Operations

Rotary coring continued throughout the 27th and 28th, however harder ground conditions resulted in shorter runs and reduced recovery during this period. A final depth of 704.9m was reached for Hole M0079A, with the last core on deck at 00:45hrs on the 29th of November.

Logging operations commenced early on the 29th (collecting magnetic susceptibility-conductivity, resistivity and sonic (velocity) data) in the upper ~230-290 m of Hole M0079A, (logging in the deepest part of the section was not possible) and continued until the afternoon of the 1st of December. After completion of downhole logging, the pipe was tripped and the seabed template and DP transponder were recovered.

The vessel started to transit to Site M0080, collecting four surface sea water samples en-route for comparison with pore waters extracted from the cores. Arrived on site at 02:05 hrs. The vessel settled on DP, ran pipe and lowered seabed frame to seabed by 05:30 hrs on 2nd December. Following this, coring commenced and was continuing well at 24:00 hrs on the 3rd following a short break for a CPT measurement in the early hours.

2. Hole summary

Hole	M0079A
Latitude	38° 9' 30.243" N
Longitude	22° 41' 43.316" E
First core	144R
Last core	163R
Cores recovered	20
Drilled length (Coring)	74.60
Drilled Length (Open Hole)	0
Recovered length	54.45
Depth in hole	704.90
Hole recovery	73%

Hole	M0080A
Latitude	38° 7' 12.1467" N
Longitude	23° 5' 10.6138" E
First core	01P
Last core	46R
Cores recovered	46
Drilled length (Coring)	164.00
Drilled Length (Open Hole)	0
Recovered length	159.19
Depth in hole	164.00
Hole recovery	97%

Table 1a) Hole M0079A and 1b) M0080A progress (27th Nov 00:00 – 3rd Dec 24:00)

Hole	**M0078A**	**M0078B**	**M0079A**	**M0080A**
Status	Complete	Complete	Complete	Current
Cores recovered	176	15	163	46
Drilled length (Coring, m)	610.43	55.85	704.90	164.00
Drilled length (Open hole, m)	0	0	0	0
Recovered length (m)	533.99	52.17	610.80	159.19
Recovery (%)	87%	93%	87%	97%
Final depth / Depth at midnight (mbsf)	610.43	55.85	704.90	164.00
Proposed site depth (mbsf)	750.00	N/A	750.00	479.00

Table 2 - Expedition 381 progress update

3. Science

During the past week, shipboard scientists undertook routine characterization of the lower 135 m of M0079A (the deepest part of the most recent syn-rift sequence and transition into the penultimate rift phase sequence) and the uppermost ~150 m of M0080A. Site M0080A is located in the Alkyonides Gulf, a smaller basin east of the Gulf of Corinth, and is being drilled to test spatial variation in rift history and development. Time was also spent synthesizing the results from the entirety of M0079A and comparing with observations from M0078A.

A similar series of sedimentary facies related to alternating marine and isolated intervals in the upper seismic unit at M0079A can be correlated to those observed at M0078A. Likewise, multi-sensor core logger data and core-log-seismic integration suggest that similar patterns in physical properties and predicted seismic reflections are associated with the alternating marine and isolated intervals at both sites and can be correlated. Within the deepest part of M0079A, a distinctive marine interval was identified which appears to be comparable to a similar interval in M0078A. Pore-fluid geochemistry shows variations in alkalinity between marine and isolated intervals at M0079A that are similar to those at M0078A. Salinity profiles in the shallow sections of M0079A and M0078A are also similar, but markedly different in the deepest parts of the two holes.

Evaluation of logging data is ongoing, but initial inspection allows some correlations between downhole logging and MSCL datasets.

The scientists started to analyze the cores from Site M0080A. Distinctive marine intervals with diverse microfossil assemblages have already been observed in the cores including intervals with transported shell material, in greater abundance than in the cores at the previous 2 sites. The upper cores of M0080A also contain microfossil assemblages that are slightly different from those observed at the previous two sites, possibly reflective of proximity to the shoreline and shallower water depth. A CPT (in situ temperature and friction/strength) measurement was taken at ~100 mbsf in Hole M0080.

The scientists also held meetings to discuss preliminary results from Site M0079.

4. HSE Activity

A Fire and Abandon Ship drill was completed successfully on the 3rd of December.

5. Outreach Activity

During the week, three blogs were published to the WordPress blog page. Seven posts were made to the Facebook page - a mixture of photo galleries, videos and links to the blog posts. Two videos were posted to the YouTube site.

Between the 27th November and the 3rd of December, the Expedition blog-site received 950 views, 196 visitors, and is being followed in 19 countries. The Facebook posts reached 2950 users (a 900% increase) and the YouTube videos were watched 125 times.

In addition a ‘Donna Shillington Tour’ video was recorded, edited and published at very short notice to be shown at the ‘ECORD School of Rock’.

6. Figures

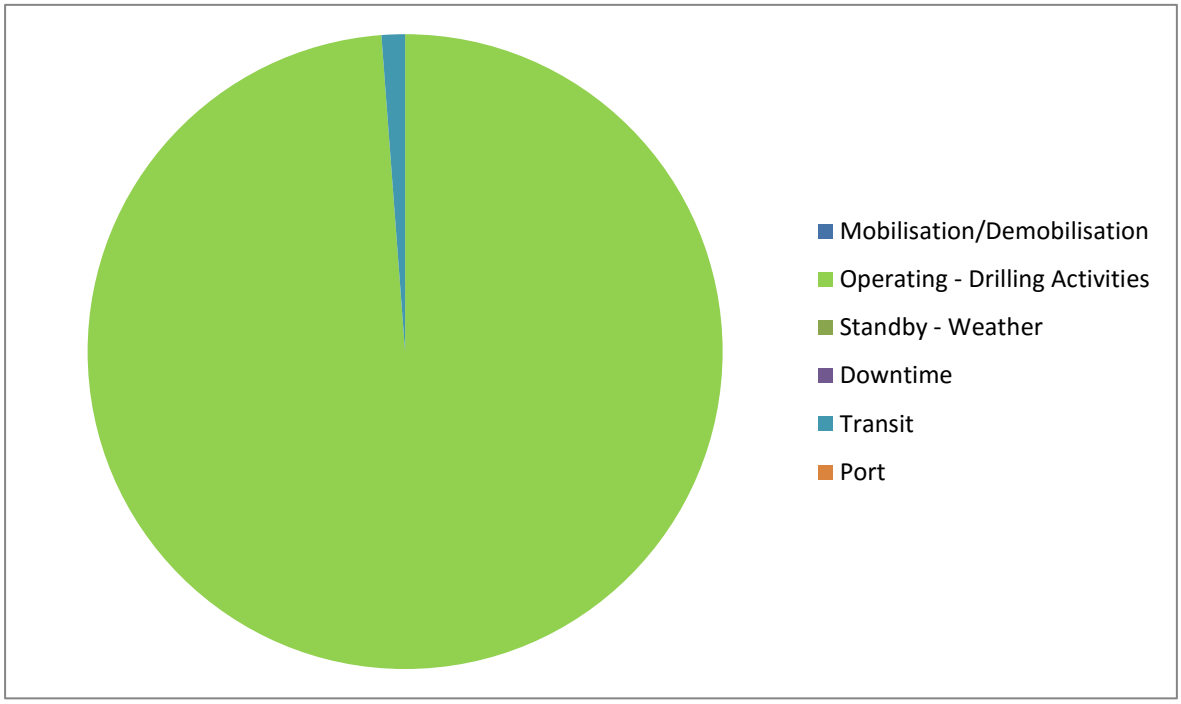

Figure 1: Breakdown of hours from 00:00 November 27th to 24:00 December 3rd 2017.

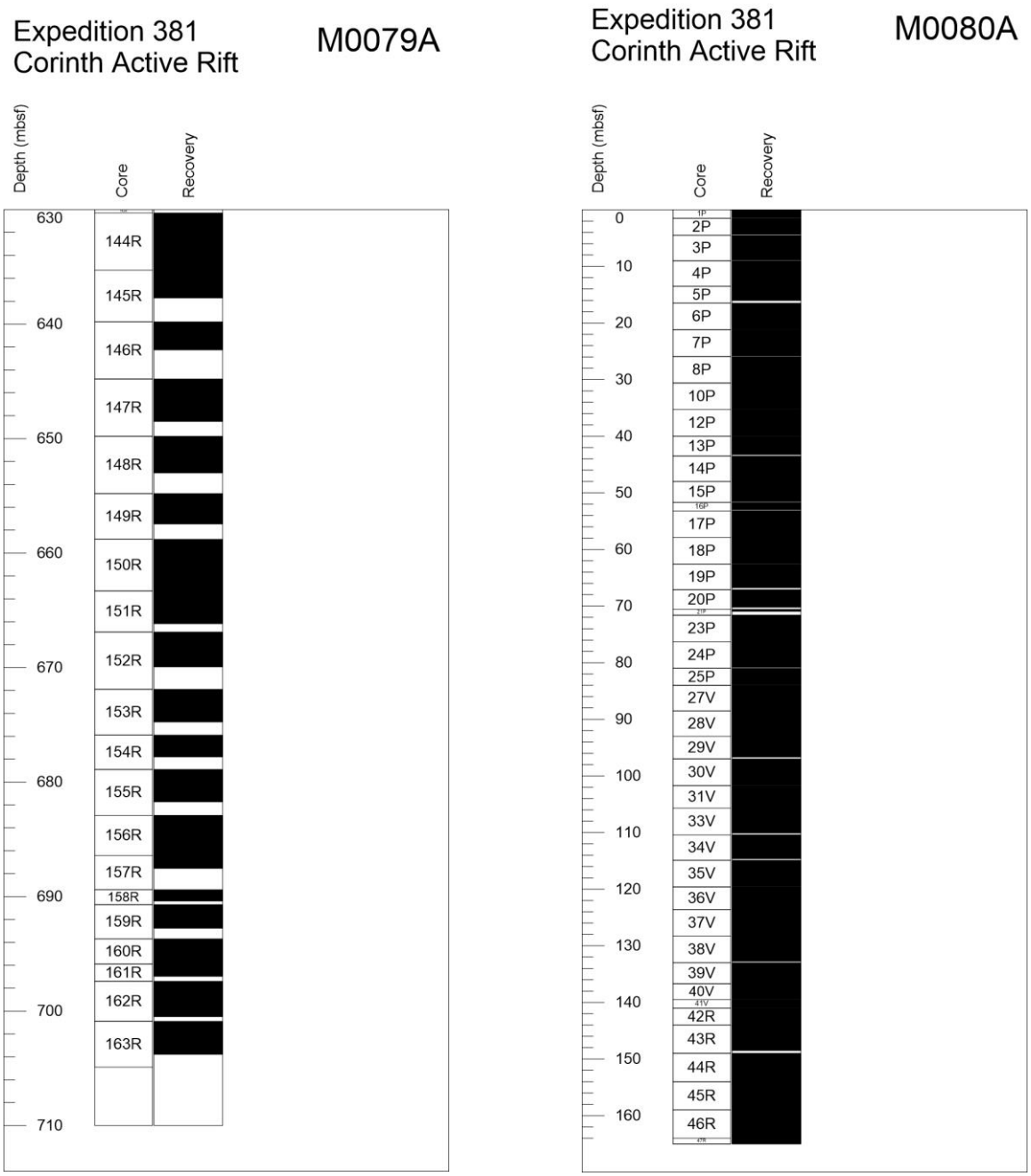

Figure 2: Core recovery for Week 6 (27th Nov to 3rd Dec 2017).

Photographs

Figure 3: Photos from Week 6 of Expedition 381.